REMARKS/ARGUMENTS

In this response, the Applicant has cancelled claim 33, and added claims 34 and 35 to particularly point out certain novel features of the present invention. The Applicant respectfully submits that the aforementioned changes do not add new matter, and that the amended and new claims are supported by the previously filed specification.

Claim Objections

The numbering of claims 21-23 have been renumbered 31-33, as suggested by the Examiner. Moreover, claims 21-30 are withdrawn without prejudice.

Priority

Enclosed herewith is a certified copy of the Canadian application, to perfect the priority claim under 35 U.S.C. 119(b).

Rejection Under 35 U.S.C. §102

The Examiner has rejected claims 1-5, 8-10 and 16 under 35 U.S.C. §102(b) as anticipated by Weston (US 4962978). Reconsideration thereof is requested in light of the following.

Claim 1 of the instant invention teaches a main wing as the principal means for maintaining said fuselage above and out of the water. The Weston patent, on the other hand, teaches a seaplane where the fuselage does not remain above and out of the water. In fact, from the Figures in the Weston patent, it is clear that the fuselage is responsible for a substantial, if not the main, fraction of the buoyancy.

Any doubts entertained by the Examiner about the accuracy of the last paragraph are dispelled when the passage at column 2, lines 2-5, which was referred to in the Office Action, is examined more closely in light of the figures: the lowest part of the aircraft of the Weston patent is not part of the wing, as the term "wing" would be

understood by someone of ordinary skill, but rather part of the fuselage. In fact, it is well known in the industry that the type of fuselage/wing construction shown in Weston, is a so-called "blended wing-body" aircraft construction that under proper circumstances can be utilized to reduce interference drag of an airplane. The B2 stealth bomber is a notable example. It is therefore not accurate to say that just the "wing" alone is immersed in this case since the immersed structure is really a blend of fuselage and wing. In fact, in Weston, the need for wing-tip stabilizing pontoons (28) indicates that the craft's buoyancy is almost entirely supplied by the "blended" portion of the craft and that the outboard portions of the more unblended portion of the "wing" are in fact above the waterline requiring wing-tip sponsons to provide lateral stability. This is more akin to the flying boat family of seaplanes where the fuselage rests on and the wing remains clear of the water; flying boats also require outboard sponsons for lateral stability.

In the present invention, submerged portions of the main wing and pylon (58) as well as the horizontal stabilizer provide floatation buoyancy and lateral roll stabilization without the need for wing-tip sponsons or any other additional drag-producing structures. Further, in the present invention, the fuselage remains distinctly free of the water to be optimized for aerodynamics only. This was accomplished in part through the use of the pylon (58) that connects the fuselage (12) and wing (14). In this way, the functions and positions of the fuselage and the main wing are clearly defined in the present invention in contrast to 978.

Instead of using a blended wing/body concept for the aircraft of the instant invention to reduce interference drag, an inverted "parasol" wing configuration is used instead. This configuration has acceptable levels of interference drag on the order of 5% of the overall aircraft drag, which is typical for a non-seaplane. In addition, the blended wing/body configuration can actually increase overall aircraft drag due to the much more significant increment in skin-friction drag produced by the added surface area of the "fillets." Skin friction drag typically accounts for 50% to 60% of total aircraft drag, which explains why only certain configurations of aircraft are seen, such as mid-wing aircraft that includes most modern fighters and flying wing aircraft utilizing blended wing/body

concepts. Low wing or high wing aircraft may not necessarily benefit from blending since the large filleting area required usually produces too much additional skin friction drag thereby negating the perceived benefit. Evidence for this is shown in attached Appendix B, which includes excerpts of a wind-tunnel report on a 1/7 scale Floatwing aircraft that was performed at the University of Toronto Institute for Aerospace Studies (UTIAS). In particular, note the increase in overall aircraft drag coefficient between configuration 5 and configuration 6 where wing junction fillets had been introduced to reduce interference drag.

In summary, the present invention utilizes an inverted "parasol" wing coupled to the fuselage with a streamlined pylon that separates the wing and fuselage to limit interference drag as well as to provide additional floatation over and above that provided by the immersed portion of the main wing. This enables the fuselage to remain clear of the water thus allowing optimization of the fuselage for aerodynamics only. The patent of Weston, on the other hand, teaches a blended wing-body seaplane where the fuselage does not remain above the surface of the water, but rather provides a substantial, if not the main, portion of the buoyant force that keeps the plane afloat.

For the above reasons, the Applicant requests that the Examiner reconsider the rejection of claim 1, and claims 2-5, 8-10 and 16, which depend from claim 1.

Rejection Under 35 U.S.C. §103 as Obvious in light of Weston

The Examiner has rejected claims 6, 7, 11-15 and 32 under 35 U.S.C. §103(a) as unpatentable over Weston (4,962,978). Reconsideration thereof is requested in light of the following.

Claims 6,7 and 11-15 depend from claim 1, which recites a main wing that is adapted to float on water and principally maintain the fuselage above and out of the water. This feature is neither obvious nor taught in Weston, as argued above. Therefore, reconsideration of claims 6, 7 and 11-15 is requested.

Claim 32 recites a main wing to provide flotation to keep the fuselage substantially above water while the airplane is resting therein. As argued above, Weston teaches a seaplane where a substantial portion of the fuselage lies below the water. Therefore, reconsideration of claim 32 is requested

Rejection Under 35 U.S.C. §103 as Obvious in light of Weston and Rethorst

Claim 33 was rejected as obvious in light of Weston and Rethorst. Claim 33 is cancelled without prejudice.

Allowable Subject Matter

Claim 17 has been rewritten in independent form to include the limitation of the base claim 1. There are no intervening claims. Further to the opinion of the Examiner, claim 17 is now allowable.

The Applicant thanks the Examiner for allowing claims 18-20 and 31.

New Claims

The Applicant has added new claims 34 and 35.

New claim 34 teaches a main wing that provides flotation to keep the fuselage substantially above water while the airplane is resting therein. This feature is taught in neither Weston nor Rethorst, as argued above.

In addition, claim 34 teaches a main wing having a trailing edge that functions as a step to break suction between the water and the airplane to allow water take-off. This feature of the main wing obviates the need for the steps of previous designs. This is a significant contribution since by far and above the greatest contribution (20% to 38%) to an increase in overall fuselage aerodynamic drag coefficient is that due the addition of

hydrodynamic "steps" (see attached appendix A, Table 1.2). Neither Weston nor Rethorst teach such a main wing that functions as a step. In fact, Weston has included no less than three hydrodynamic steps (parts 17(2) and part 15). Favorable consideration is therefore requested.

New claim 35 teaches a pylon disposed at the bottom of the fuselage for connecting the fuselage to the main wing, the pylon being of sufficient buoyancy and height to keep the fuselage substantially above water while the airplane is resting therein. The pylon provides floatation buoyancy without the need for wing-tip sponsons or any other additional drag-producing structures. Use of the pylon has an additional benefit for the present invention: once hydroplaning is achieved on the main wing, the horizontal stabilizer (16) and its support boom are well above the water surface. This gives the floatwing aircraft of the present invention a larger than usual rotation angle for takeoff which means shorter takeoff rolls, especially if the aircraft is equipped with a STOL wing that incorporates leading edge high lift devices such as slots or slats for example.

Such a pylon is taught in neither Weston not Rotherst. Therefore, favorable consideration of claim 35 is sought.

Respectfully submitted,

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